Serial No.: 09/857,936

REMARKS

Claims 1 and 3-24 are pending in the application. Favorable reconsideration of the application is respectfully requested.

Applicants acknowledge with appreciation the Examiner's withdrawal of the previous grounds of rejection.

I. REJECTION OF CLAIMS 1 AND 3-24 UNDER 35 USC §102(b)

Claims 1 and 3-24 now stand rejected under 35 USC §102(b) based on Duggan. Withdrawal of the rejection is respectfully requested for at least the following reasons.

i. Present Invention

The present invention as recited in claim 1 includes, *inter alia*, (a) an electron reflecting barrier provided between the cladding region and the active region, the reflecting barrier having a greater potential barrier to Γ-electrons than the p-doped cladding region, and (b) the electron-reflecting barrier comprises a first electron-reflecting layer for reflecting Γ-electrons and a second electron-reflecting layer for reflecting X-electrons.

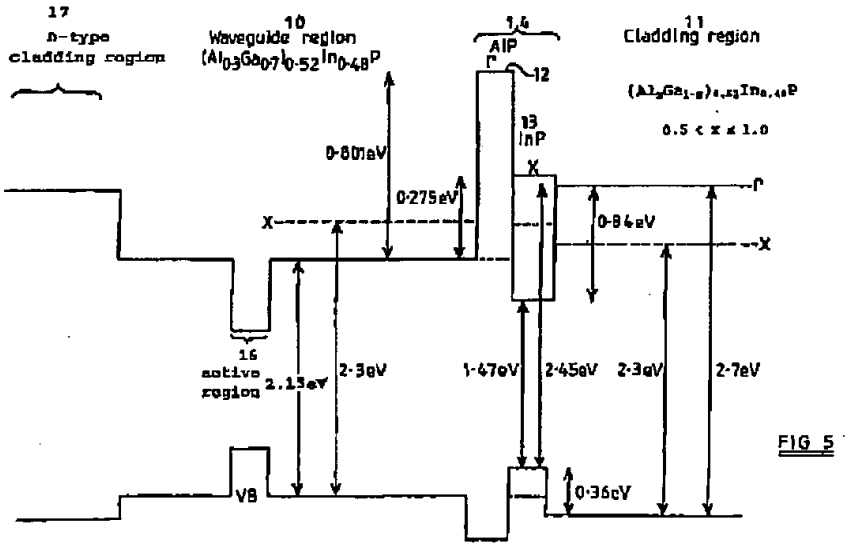

FIG 5

Fig. 5 of Present Application

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As is exemplified in Fig. 5 of the present application (reproduced above), the reflecting barrier 14 is provided between the active region10 and the cladding region 11. The reflecting barrier 14 includes a Γ-electron reflecting layer 12 and an X-electron reflecting layer 13, such that the Γ-electron energy level of layer 12 is much higher than the Γ-electron energy level of the cladding region 11.

Claim 20 recites that the electron-reflecting layer is formed of AlP. Such feature is exemplified in Fig. 4 of the present application, in which a Γ-electron reflecting layer 12 advantageously provides a very high barrier to Γ-electrons.

ii. Duggan

The present application discusses Duggan at page 6, lines 15-19. The specification states that Duggan describes a semiconductor laser which incorporates an electron reflecting layer, to prevent *X-electrons* escaping into the p-doped cladding region. However, this does not suggest that Duggan teaches an electron reflecting layer to prevent *Γ-electrons* escaping into the p-doped cladding region as recited in claim 1. Further, this does not suggest that Duggan teaches a barrier layer provided between the cladding region and the active region as recited in claim 1.

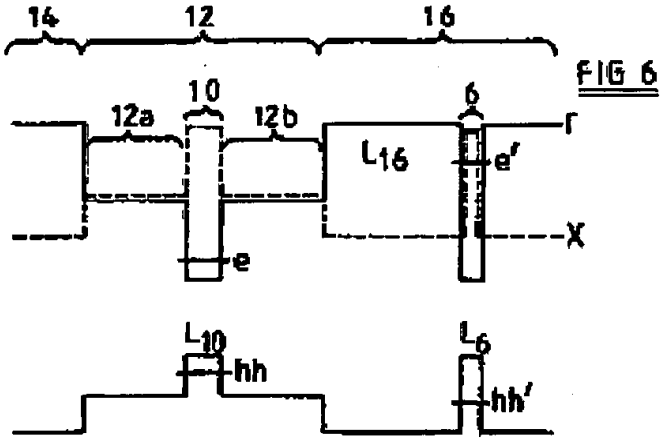

Fig. 6 of Duggan

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As is shown in Fig. 6 of Duggan (reproduced above), for example, the barrier layer 6 is provided inside the cladding region 16. The barrier region 6 is not provided between the cladding region 16 and the active region 10 as recited in claim 1.

Furthermore, the Γ-conduction band of the barrier layer 6 in Duggan is significantly lower than the Γ-conduction band of the cladding region, as can be clearly seen from the upper continuous line in Fig. 6. Thus, the barrier layer 6 does not provide a greater potential barrier to Γ-electrons than the cladding region 16 as recited in claim 1. Rather, the barrier layer 6 has a higher potential barrier to the X-electron conduction band.[1]

Still further, claim 1 recites the "electron-reflecting barrier comprises a first electron-reflecting layer for reflecting Γ-electrons and a second electron-reflecting layer for reflecting X-electrons." As argued in applicants' previous response, claim 1 contemplates a separate layer for reflecting Γ-electrons and a separate layer for reflecting X-electrons. Duggan does not teach or suggest separate reflecting layers for Γ-electrons and X-electrons, respectively. Rather, Duggan describes adjusting the thickness, spacing, number of barriers, etc., so as to form an overall X-electron barrier which also may apparently function as a Γ-electron barrier.

Regarding claim 20, the electron-reflecting layer is formed of AlP. The Examiner contends that Duggan teaches an electron-reflecting layer formed of AlP. While Duggan teaches the barrier layer 6 as being an alloy of AlGaInP, Duggan does not teach or suggest that the electron-reflecting layer is formed of AlP as recited in claim 20.

As a result, Duggan fails to teach or suggest each and every feature of claims 1 and 20. Therefore, the rejection of claims 1 and 20 should be withdrawn. Furthermore, claims 3-19 and 21-24 each depend from claim 1 or 20 directly or indirectly, and can be distinguished on at least the same basis. Withdrawal of the rejection is respectfully requested.

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[1]Applicants note that the lower continuous line in Fig. 6 of Duggan actually refers to the valence band, which is not related to the present invention.

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II. CONCLUSION

Accordingly, claims 1 and 3-24 are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should a petition for an extension of time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988.

Respectfully submitted,

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